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Reports
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Diagrams of Larvae of Spruce Budworm and Associated Species

DIAGRAMS OF LARVAE OF SPRUCE BUDWORM AND ASSOCIATED SPECIES

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INTRODUCTION

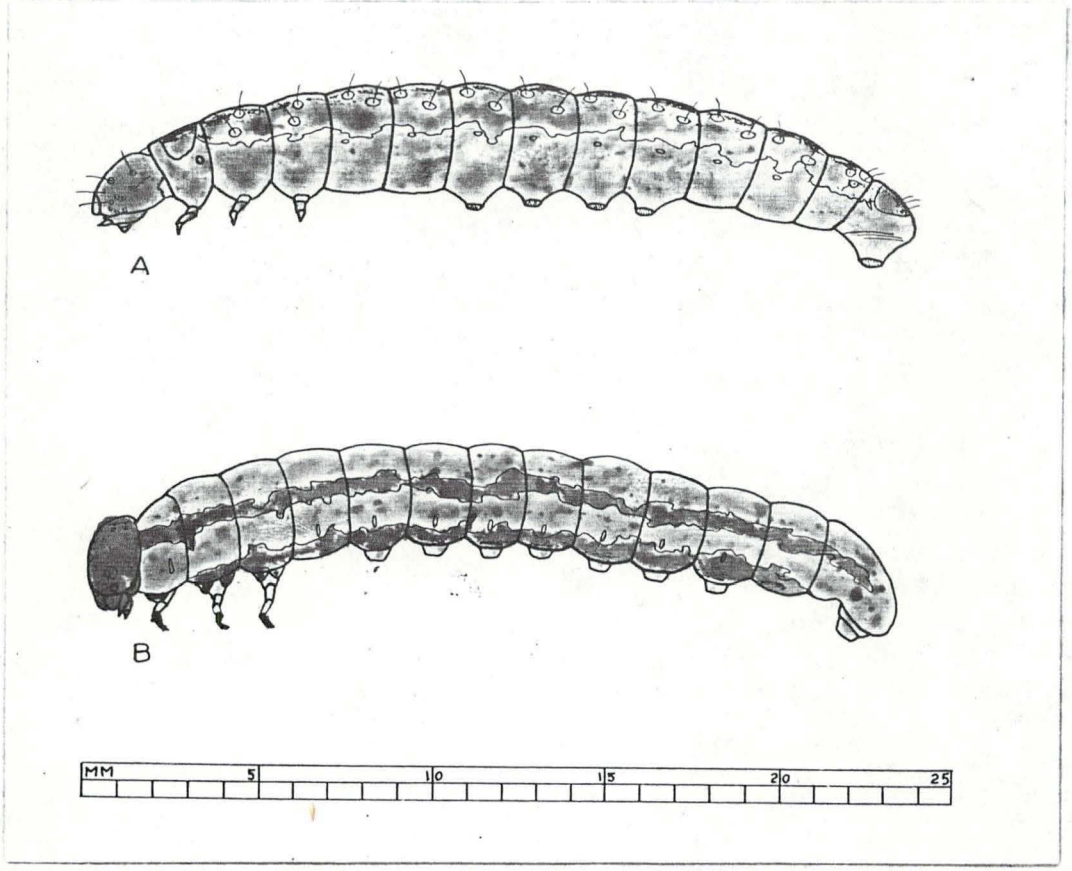
The general purpose of these diagrams and the accompanying dissertations is to facilitate recognition of the spruce budworm during sampling. Specifically, these initial efforts are to aid biologists and checkers in separating the larvae of associated species from those of the spruce budworm during the 1958 control project.

All species shown are associated with the spruce budworm on Douglas-fir and white fir in eastern Oregon. Most of these species resemble the spruce budworm in only one or two larval instars. With the use of a hand lens and reference to these diagrams, these species can be separated with little difficulty.

All diagrams represent a magnification of six times. In general body form is rather accurately shown. Some difficulty was experienced in duplicating colors typical of living specimens. In most cases, living material was not available at the time the diagrams were prepared. However, this effort is exploratory and the form and substance of the presentation will be improved as time goes by.

PREFACE

Distinguishing between True Caterpillars (Larvae of Lepidoptera) and Larvae of Sawflies (Hymenoptera)

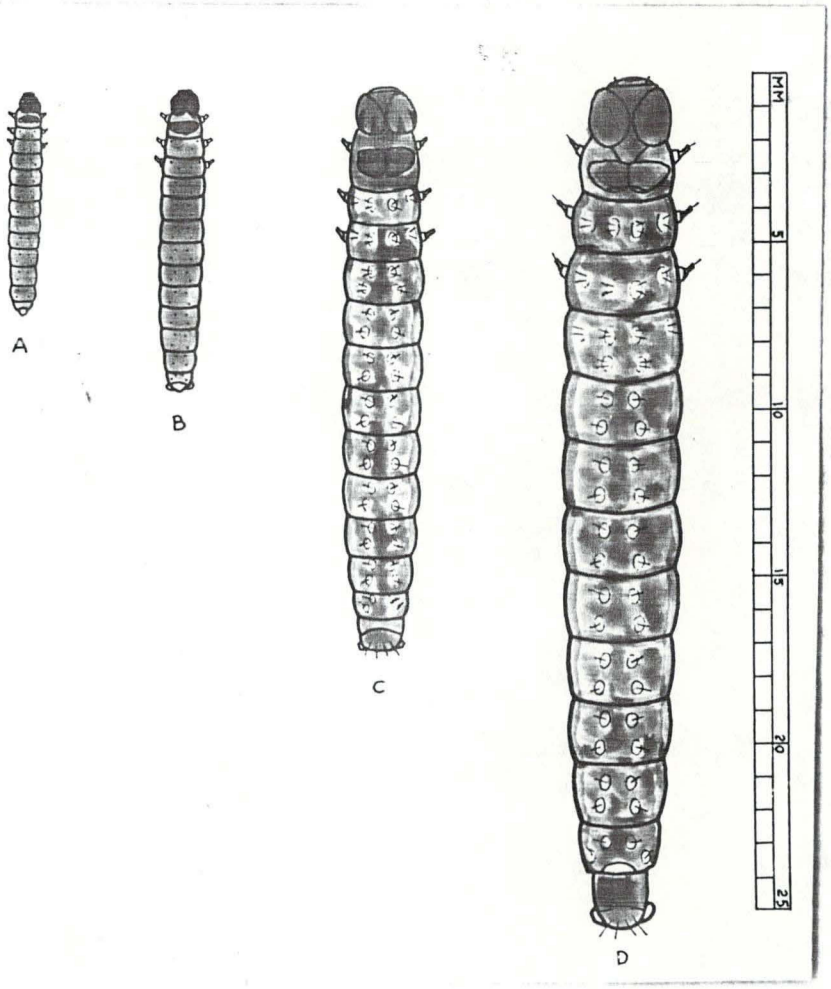


Note the number of false legs on the abdomen. The larvae of Lepidoptera have a maximum of five pairs of false legs (including those on the last segment), while those of sawflies have seven to nine pairs.

SCIENTIFIC NAME: Choristoneura fumiferana (Clem.)

COMMON NAME: Spruce Budworm

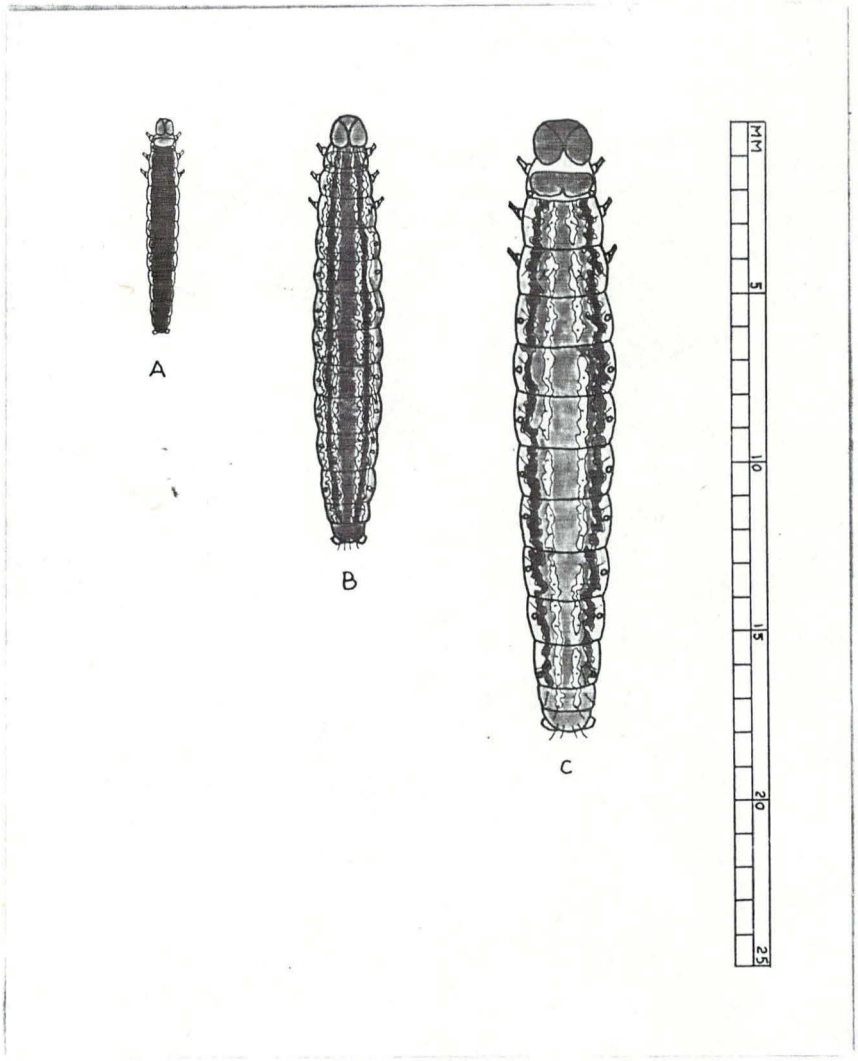
These drawings show the appearance of the spruce budworm larvae in the 3d instar (A) to the 6th and final instar (D). These are the forms found feeding progressively on the opening buds and the new foliage. Simple characteristics exist for separating the instars, in addition to head width and body length. The third instar may be separated from the fourth by its orange brown color and the undulation on the rear margin of the prothoracic shield. The fifth instar may be separated from the sixth (as well as the fourth) by the black triangular markings on the reddish brown or tan color of the head. The third and fourth instars are inclined to stay in place while feeding, although moving within the web when disturbed. However, the fifth and sixth instars are very irritable and will leave the web to drop on silken threads when disturbed.



SCIENTIFIC NAME: Dioryctria reniculella Gr.

COMMON NAME: Spruce coneworm

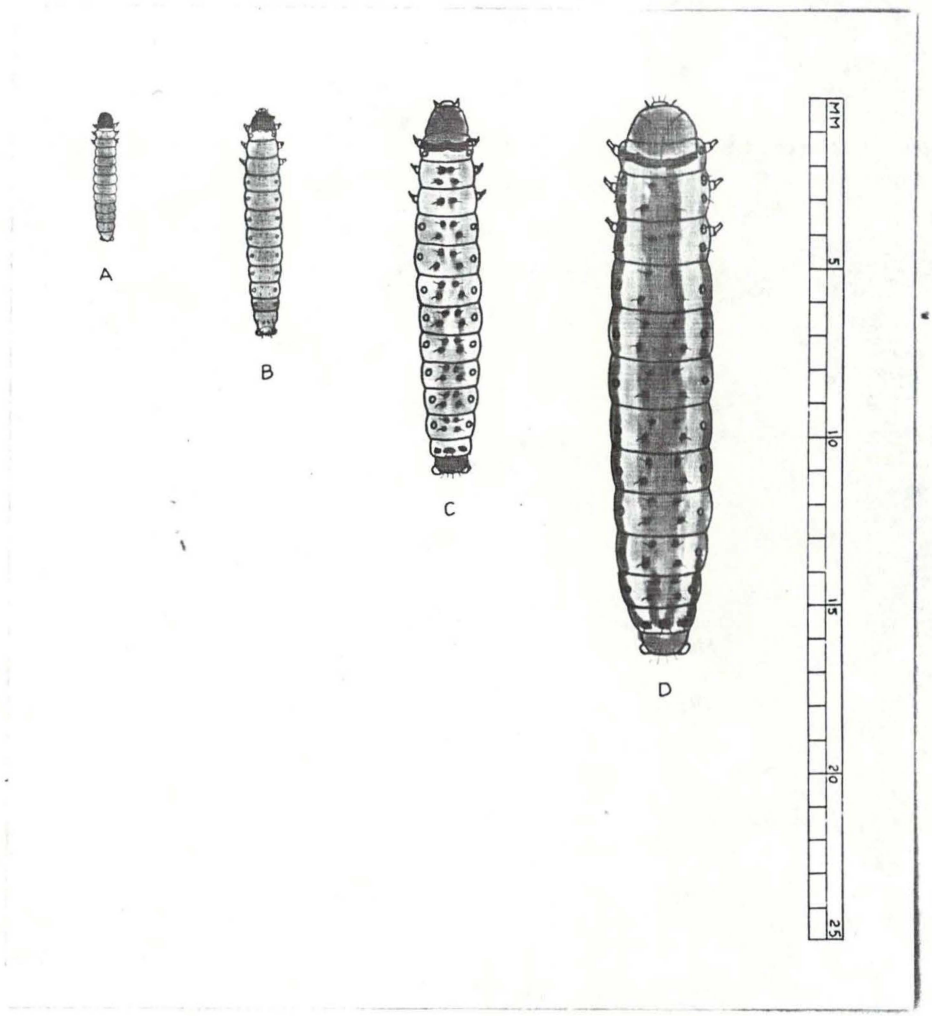
This species is the most consistent associate of the spruce budworm, although not usually numerous. Its feeding habits are identical with and synchronized with those of the spruce budworm. Because of these similarities, the larvae are often accidentally counted as spruce budworm, particularly during the bud-mining period. Examination with a hand lens at this time, however, discloses the numerous fine white lines on the body, which, along with coloration of the head and shield, separates it from the budworm.



SCIENTIFIC NAME: Zeiraphera griseana (Hbn.)

COMMON NAME: Larch bud moth

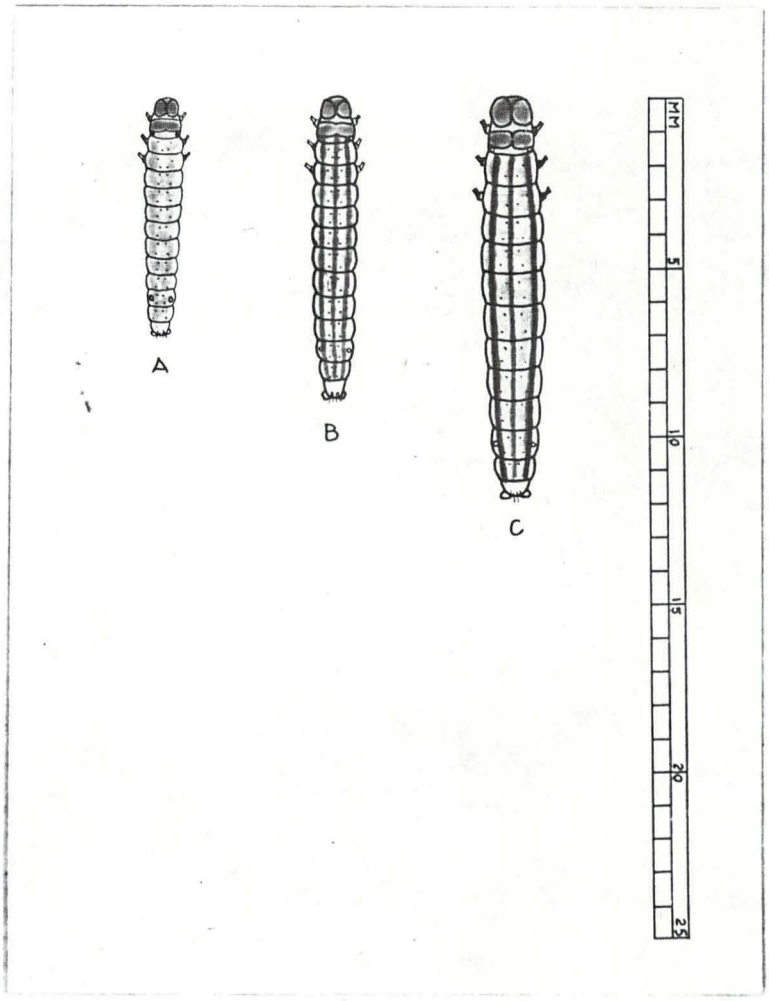
Despite its name, this species is often common on Douglas-fir. Its larva resembles the spruce budworm in only one instar, labelled below as "B". Compared with the spruce budworm 4th instar, the larch budmoth differs as follows: slightly smaller; body color paler, setal bases blackish giving a slight spiny aspect; three rounded sclerotized areas on the next to last body segment; the larva itself is sluggish and slow-moving.



SCIENTIFIC NAME: Griselda radicana (Wals.)

COMMON NAME: Griselda (local usage)

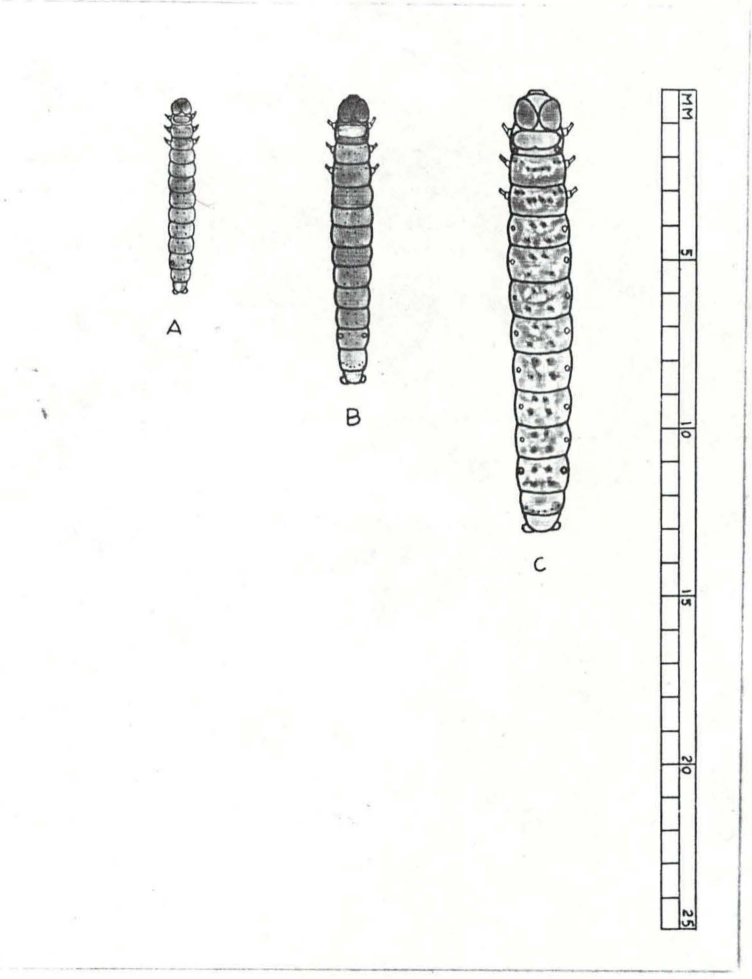
The larvae do not normally resemble those of the spruce budworm in any of the instars shown, which are the 3d to 5th (A-C). The coloration is entirely different, except for the tiny 2d instar (not shown), and the size is consistently smaller. The development lags behind that of the spruce budworm, and the last instar larvae (C) are present for a month after the budworm pupates. During this period they lose the striking reddish-brown lines and become pale in color. During post-spray counts, it is possible to confuse these with stunted spruce budworm containing parasites, which are also pale but show a distinctive color pattern.



SCIENTIFIC NAME: Argyrotaenia dorsalana (Dyar)

COMMON NAME: "Green headless wonder" (local usage)

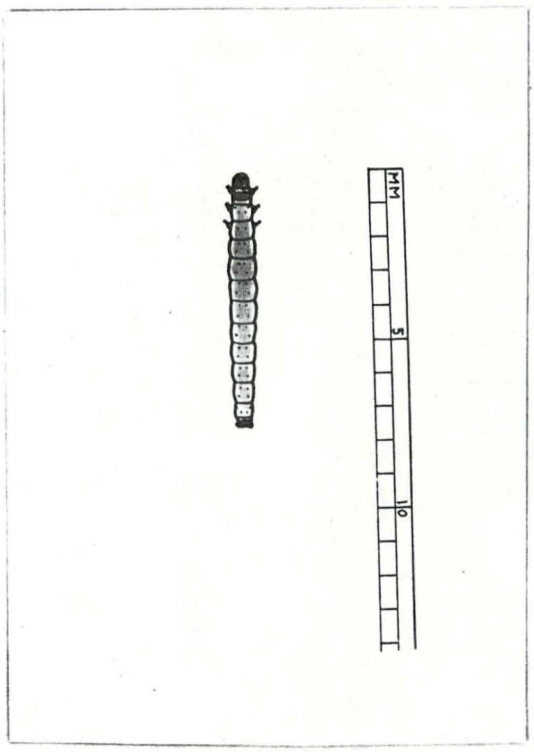
The odd common name applied to this insect was derived from the habit of the full-grown larvae feeding on a bud with the head concealed but the body readily visible. The larvae resemble the spruce budworm in feeding habit, although smaller in size than the accompanying budworm, and may be easily separated by coloration. Pupation occurs just before that of the budworm, and an occasional pupa may be found at the time of post-spray sampling. The pupae are somewhat smaller and more slender than the spruce budworm, and have a green tinge to the dark body.



SCIENTIFIC NAME: Recurvaria near piceaella Kearf.

COMMON NAME: Recurvaria (local usage)

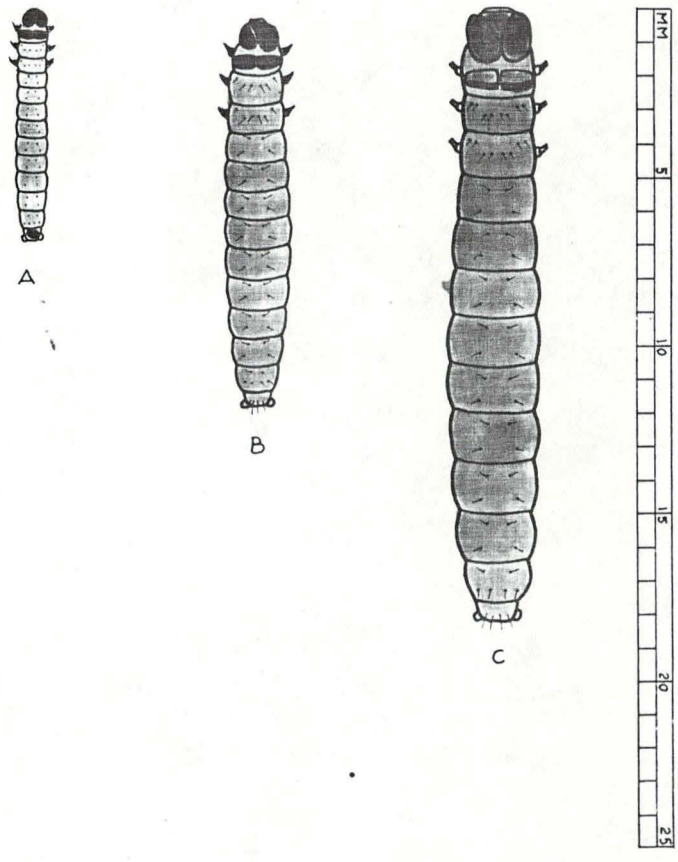
This species is primarily a needle miner, forming a nest of 5 - 8 partially mined needles. However, shortly after the buds open, the full-grown larvae attack the new foliage. A long cylindrical silken tube, 7 - 10 mm long, is normally constructed up to the attacked bud. At this time the larva is about the same size and to the naked eye similar in color to the 3d instar spruce budworm. However, the light chestnut brown color of the narrow head, prothoracic shield, and anal shield and the extremely nervous habit of the larva distinguish it at once.



SCIENTIFIC NAME: Acleris variana (Fern.)

COMMON NAME: Black-headed budworm

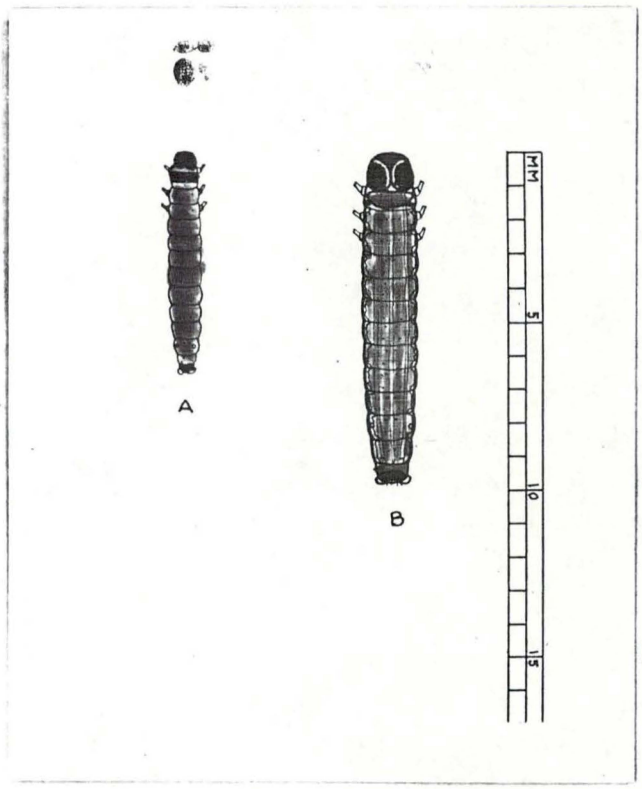
In the early instars, the larvae of this species resemble the spruce budworm in body form and size. However, at this time the bright yellow body and the jet black color of the head, prothoracic shield, and legs provide distinctive characters for separation. In the last instar the larvae are green and there is no possibility of confusing the two species. On the west side the preferred hosts of the black-headed budworm are western hemlock and silver fir. On the east side, this species is found most commonly on subalpine fir.



SCIENTIFIC NAME: Unknown

COMMON NAME: Black-ended budworm (local usage)

During the instar shown as A, the larvae resemble those of contemporaneous spruce budworm larvae very closely. The setal bases, although narrow, are quite black, and impart a spiny appearance to the body. The best character, however, is the very dark color to the last body segment (anal plate). Upon molting into the following instar, the larvae develop lines. This species has not been successfully reared to the adult stage. It is generally very rare, and is found in measurable numbers only at a spot here and there.



SCIENTIFIC NAME: Eucordylea sp. and Telphusa sp.

COMMON NAME: None

The full-grown larvae are present at the same time as full-grown spruce budworm larvae. However, they are much smaller and more slender in comparison, and exceedingly active. The lavender lines are present in all the advanced instars, so that no confusion can exist as to coloration. Recognition of these larvae is chiefly a matter of curiosity.